

same thing, — either as fascia in process of formation by union of opposite streaks, or as fascia breaking up into streaks — and the apical dusting and spot are very variable in many species, and are only different phases of the same phenomenon.

Altogether *Lithocolletis* is a very well marked and homogeneous genus of beautiful and gaily colored little moths, and, as a genus, is perhaps unsurpassed in beauty, though *Cemios-toma* and individual species of other genera, as *Lithariapteryx abroniaella* Cham., or *Strobisia viridipennella* Clem. (the rival queens of the *Tineina*, in my judgment, and even the rivals of any *Papilio*, *Ornithoptera*, *Charaxes*, or *Urania*), may surpass any individual species of *Lithocolletis*. *L. ornatella* will, however, “hold up its head with the best.” *V. T. Chambers.*

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### On the Structure of the Head of *Atropos*.

In the last number but one of *PSYCHE* (vol. ii, 49–51) Mr. Scudder has called attention to the erroneous description, by previous authors, of the mouth parts of *Atropos*, the common book-louse. Recent dissections of these parts, made not only on *Atropos*, where their minuteness renders study very difficult, but also on *Psocus*, leads me to believe that Mr. Scudder, equally with his predecessors, has failed to recognize their true structure. As I hope to give the results of my studies in detail elsewhere,<sup>1</sup> I will confine myself at present to the anatomy of *Atropos*.

It is somewhat singular that the structure of the maxilla in the *Psocidae* has never received more attention, as it seems to have no parallel among other insects. In *Atropos* and other members of this family, the maxilla consists of two small basal joints bearing outwardly a normal four-jointed palpus, and inwardly a broad, thin blade, narrower towards the tip, which curves over so as to form a sort of cover or “galea” to the sides of the mouth. As the thickened rim of one blade strikes on that of the opposite one (at least in *Psocus*), this organ may be used to aid the work of the mandibles in biting.

<sup>1</sup> Proc. Bost. Soc. Nat. Hist., XIX, 291.

This blade is supposed to be homologous with the outer lobe of the typical maxilla, which forms the galea in the Orthoptera. Behind and crossing this part lies the long forked rod, or "fish-bone" of Burmeister, supposed to represent the inner lobe or blade of the maxillæ, and which I shall call the "fork." Mr. Scudder was led, by the appearance of a specimen of *Atropos*, to consider that this fork consists of two elbow-jointed pieces, capable of being thrust suddenly forward to pierce any object. In an insect, however, which feeds on decaying vegetable or animal matter, such an organ would seem rather out of place, and in fact does not exist. The fork may be described as a long flattened rod or bone, slightly curved inwards, projecting between the blade of the maxilla and the labrum; its free or distal end forked with short tines, the outer tine being the longer.

In a position of rest the base of the fork reaches far back into the head. Near or beyond the middle, the fork is sharply contracted and then gradually tapers to the base. At the point of contraction the bone enters, and unites with, the lining membrane of the mouth. The base of the fork is embedded in a cone-shaped mass of extensor muscles; of which one large one runs into the upper part of the cardo, and was mistaken, I presume, by Mr. Scudder, for the inner arm of his supposed elbowed fork. The fork lies, moreover, between the rest of the maxilla and the flexor muscles of cardo and blade, so that they must aid in keeping it in place. It will be seen, therefore, that the bone is not articulated either to the maxilla or to the head, but is held in place by the muscles at its base and the membrane which it pierces and is attached to, near the middle. This membrane is probably more or less elastic, and allows the fork to be slightly projected and retracted, while the muscles move it about in various directions. Its probable use would thus seem to be that of a sort of pick to detach particles of food and bring them within reach of the mandibles, which are covered by the upper lip, and would be perhaps with difficulty themselves applied to detach portions from a mass of food. The question of homologizing the fork with the inner lobe of the maxilla, I think must be still left open.

The other mouth-parts may be briefly described as follows: the enormous, vaulted clypeus bears a short, broad labrum, the rim of which is bent over inwards, and bears two hooks pointing obliquely inwards, and separated by a distance equal to about one third of the breadth of the labrum. In a state of rest, the two lobes of the labrum fit in between these hooks, while the labial palpi fit in just outside of them on either side, thus closing the mouth completely.

The mandibles are very strong, triangular, the cutting edge sharp, concave, toothed, above expanding into a broad molar surface with fine transverse ribs. The labium is small, its outer border with rounded off angles and extending into two trowel-shaped lobes. The labial palpi are one-jointed, and club-shaped, reaching nearly half of their length beyond the lobes of the labium.

Lying beneath the labium can be seen two yellowish organs with a leaf-shaped outline, connected by two ducts which unite into one, the latter leading into a horse-shoe shaped chitinous bone, situated just below the opening of the œsophagus; these organs I take for salivary glands.

The eyes of *Atropos* consist of a group of seven simple ocelli, six of them round and arranged in two longitudinal rows, three above and three below, breaking joints with each other, the upper row being slightly in advance; behind and above the upper row is the seventh ocellus, which is long oval in shape.

The antennæ consist of two stout basal joints, the second the longer; and a flagellum of thirteen long, slender, cylindrical joints, which show, under a high magnifying power, a delicate transverse striation.

*Edward Burgess.*

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A PLAGUE OF HORSE-FLIES. Mr. S. H. SCUDDER said that between Alkali Station and Green River, in Colorado, is a very alkaline meadow which was so infested with *Tabanus* and *Stomoxys* that during a rapid walk of one and a half kilometres past this meadow, swinging his net before him, he caught 239 *Tabanus* of one species, 28 *Stomoxys* and a few other flies. The flies began to attack him when he had approached within about five kilometres of the meadow. Not a single Orthopteron was found in the meadow, although search was made. (Oct. 12, 1877.)